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Environmental Knowledge and Attitudes: Influencing the Purchase Decisions of Wine Consumers

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Environmental Knowledge and Attitudes: Influencing the Purchase Decisions of Wine Consumers

Barber et al.: Influencing the Purchase Decisions of Wine Consumers

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ABSTRACT

Consumers' behavior is changing to integrate environmental considerations into lifestyle choices, including decisions on product satisfaction, how products affect the environment, and the price to pay for environmentally friendly products. Marketing professes to benefit the public by informing them of the availability of goods which advance their quality of life. This is only true if marketing's communication aids in informing, educating and channeling needs toward "green" products. This study investigated the relationship of wine consumer's environmental involvement, knowledge, attitudes, and willingness to purchase a product. Results suggest personality segmentation, through selective marketing and redirecting consumers' needs toward environmentally friendly wine products.

Key words: Environmental knowledge, green products, wine marketing

INTRODUCTION

Global environmental problems, such as shrinking resources, air and water pollution, and population growth, challenge the way people live. This has resulted in an increase in environmental consciousness with consumers integrating environmental considerations into their lifestyle choices. These choices also impact consumers purchasing decisions on how well products satisfy their needs, yet still reduce the negative impact on the natural environment. In some cases, consumers are willing to pay a premium for environmentally friendly products (e.g. Bazoche, Deola and Soler, 2008; GFK, 2007; Loureiro, 2003).

The United States wine industry has increasingly been confronted with pressure to improve its environmental performance. These pressures wineries have encountered range from fines for violating the Clean Water Act (Fish, 2002a) and issues with neighbors over the use of pesticides (Marshall, Corano and Murray, 2005). As a result of these pressures, there is a transformation beginning toward environmentally safer practices (Marshall, et al., 2005). For example, the industry matures giving rise to industry trade groups, most notably the Wine Institute in California has developed codes of sustainable practices to enable its members to be responsive to these pressures (Marshall et al., 2005).

Consumer involvement is an important concept in consumer marketing because it can explain various behavioral outcomes of consumers and strong attitudes regarding a social issue and product category can predict behavior (Krarup and Russell, 2005, pp 58). Yet no studies were found that considered the relationship of consumer involvement with a product and their attitudes about the environmental impact of the product. Therefore, using wine as the product, the purpose of this study is to determine the relationship of a consumer's involvement with a product and the environment, their knowledge of environmental issues and attitudes toward the environment, and their willingness to purchase the product. The implications of this research to the wine industry could be vast. As consumers' knowledge of environmental issues increase, resulting in attitude change, their choice of a wine brand or even a wine region destination may be influenced by how the consumer perceives this industry group's environmental policies. There may be applications to other hospitality products and services, such as vacation resorts or hotels.

LITERATURE REVIEW

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Results from a Gallup poll in 2003, revealed that the American public is essentially divided about whether the environment is doing well and improving, or not, with pessimists tending to outnumber optimists. Even though Americans are closely divided about the quality of current conditions, they are more definitive when asked about the future. A majority of adults, 54%, say the quality of the environment is getting worse, while just 40% say it is getting better (Gallup, 2003). GFK (2007) found four in ten Americans are willing, or have expressed the intention, to pay for a product that is professed to be better for the environment, while 55% agree numerous environmentally-safe products are not in fact better for the environment and most declare they are too expensive (74%) and don't work as well (61%).

This environmental consciousness is not only an ideology of activists, but also a matter of market competition influencing consumer behavior (e.g. Follows and Jobber, 2000). Many consumers exhibit preferences for environmental amenities, either directly through polls or surveys, or indirectly, by participating in outdoor activities, environmental organizations or causes, or undertaking conservation, recycling, or other stewardship activities (Torgler, Garcia-Valinas and Macintyre, 2008). Environmentally friendly or "green" product demand has been expanding at a remarkable rate, yet has been shown to be uneven across different market segments (e.g. Gallup, 2003). For organizations to position "green" products and services, and communicate their environmental efforts to concerned consumers, segmentation of the environmentally conscious consumer needs to be identified.

Involvement

Consumer behavior research began with a focus on involvement related to consumers' attitudes towards products. Zaichkowsky (1985) suggested involvement was the degree of perceived relevance of an object based on inherent needs, values, and interests. Involvement theory views consumer behavior as a continuum covering a range of cognitive and behavioral processes. Mittal (1989) suggested consumers that are 'highly involved', actively search for and process information to make informed product selections to satisfy their needs and wants, yet according to Barber (2008), a great deal of consumer behavior is low involvement and does not involve extensive information search and evaluation prior to purchasing. Thus, involvement is evoked differently depending upon various psychological stimuli. Research has analyzed the influences of product involvement (Barber, 2008) and involvement with environmental issues (e.g. Bredahl, 2001) on consumer attitudes, brand preferences, and perceptions. Depending on levels of involvement, consumers differ significantly on their purchasing quantities (e.g. Barber, 2008) as well as satisfaction, store and salesperson trust (Lockshin, Quester, and Spawton, 2001).

Environmental knowledge

A key factor in the successful marketing of a product is the identification of what is important to the decision-making process. For example, core wine consumers are interested in purchasing sustainable wines because they want to support producers of sustainable products and because they believe it to be better for the environment (Loureiro, 2003). Research has also shown that knowledge, in general, is directly related to many consumer behaviors. Two major approaches for measuring knowledge have been identified (e.g. Dodd, Laverie, Wilcox, and Duhan, 2005) and confirmed in recent wine studies (e.g. Barber, 2008): how much a person actually knows (objective knowledge) and how much a person thinks he/she knows, or self-assessed knowledge (subjective knowledge). Differentiation between objective and subjective knowledge occurs when consumers do not precisely recognize how much or how little they actually know and is often influenced by the consumers psychological set, as well as their ability to retrieve the information from memory.

An important component of environmental conscious consumer behavior is to increase the knowledge about products and the environment. This increased awareness of "green" knowledge has been shown to influence consumer purchasing decisions (e.g. Bazoche et al., 2008; Loureiro, 2003). Americans have begun to develop an environmentally-conscious mind-set, with half saying they do not have the information needed to be involved in increasing green behavior and are less knowledgeable about which products and packaging materials are recyclable (GFK, 2007).

Bazoche et al. (2008) and Loureiro (2003) noted that attempts to explain purchase behavior are associated with a consumer's knowledge of green issues. Although difficult to verify, consumers that are knowledgeable about the environment will be motivated toward environmentally friendly purchase behavior. Research by Martin and Simintiras (1994) found that the ability of consumers to answer questions on environmental issues correctly did not correlate with subjective environmental knowledge and purchase intention. Finally, studies on ecological purchasing

intentions (e.g. Amyx, DeJong, Lin, Chakrabotry and Wiener, 1994) and wine purchase behavior (e.g. Barber, 2008; Dodd et al., 2005) found that what consumers think they know about a subject was a better predictor than what they actually knew. These studies confirm the difficulties of measuring knowledge and the unpredictability of translating this measurement into consumer behavior.

Attitude

Attitudes are essential to consumer behavior research and marketing often seeks ways to determine and modify attitudes about products, brands, and services. One function of knowledge is to help maintain strong attitudes (e.g. Bredahl, 2001) which are typically considered strong when they are resistant to change and persistent over time. Most analyses of an attitude's strength recognize that knowledge contributes to a high attitude level. Eagly and Chaiken (1993) suggested that strong attitudes are often thought to be constructed on an extensive, well organized knowledge framework that provides an informational basis for reactions toward an issue of product.

When considering the environment, increased knowledge is assumed to change environmental attitudes, and both environmental knowledge and attitudes are assumed to influence environmental behavior (Arcury, 1990). In a study by Kollmuss and Agyeman (2002) on the relationship between environmental knowledge, environmental attitudes, and behavior using general consumer products, they found significant correlations between participant's attitudes and knowledge. They stated that the basis for many environmental problems and issues is irresponsible environmental behavior, and one of the most important influences on this behavior is attitude.

Wine as a product

Wine is an experiential consumer product that is difficult for a consumer to judge by looking at it. During the past fifteen years, wine has increasingly become a beverage most often consumed by those Americans that drink alcoholic beverages (e.g. Jones, 2007). The U.S. is currently the 3rd largest nation in total wine consumption and may top the list in the next few years (Hussain, Cholette and Sastaldi, 2007). Demand creates issues for the environmental footprint that wineries have. Although the environmental performance of the wine industry does not receive as much media attention as industries often characterized as 'dirty' such as the chemical industry, it still faces a number of serious environmental issues and challenges, such as limit their use of toxic pesticides, herbicides, fertilizers, creating a scarcity of water supplies, organic wastes, and hazardous packing materials (Marshall, et al., 2005).

Proposed Model and Hypothesized Relationships

This research proposes a segmentation approach through an analysis of the linkages between willingness to purchase behavior and measures of product involvement, environmental consciousness and knowledge. The model depicted in Figure 1 reflects the paths and the relationships between the constructs of environmental involvement, environmental knowledge and attitudes, enduring product involvement, all as independent variables and willingness to purchase as the dependent construct variable.

Research has demonstrated that involvement with a product category is an important determinant of consumer purchasing (e.g. Bredahl, 2001; Dodd et al., 2005; Orth and Firbasova, 2003), with the level of involvement in the purchase decision and the importance and intensity of the interest in a product critical to the purchase decision. Consumer behavior models reflect knowledge as a variable influencing all phases of the purchasing decision process (e.g. Barber, 2008). This knowledge is formed from a consumer's past product related consumption experience (Barber, 2008; Dodd et al., 2005), and is most commonly the construct used to conceptualize the consumer's actual purchasing and usage behavior (Barber, 2008). However, little research has been found that discussed consumer involvement in environmental issues, their knowledge of these issues, and the impact on purchase behavior.

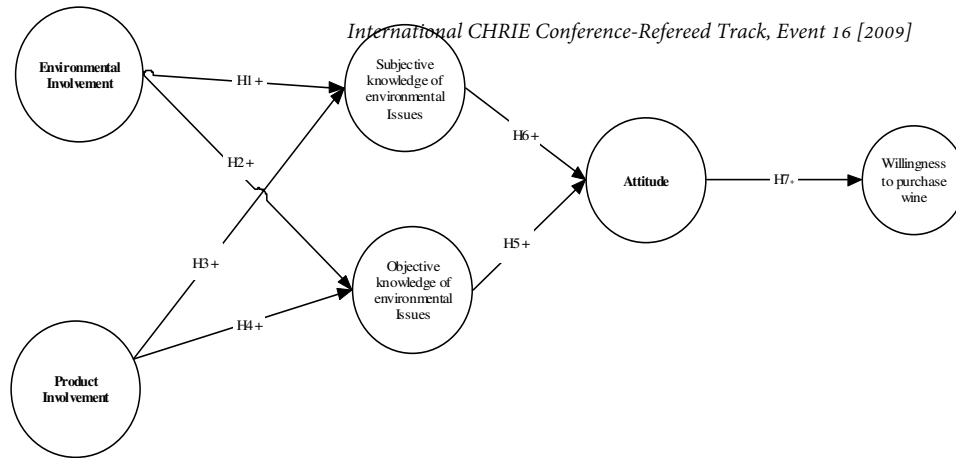


Figure 1. Proposed Model

The current study extends the defined role of involvement, knowledge, and attitude by examining the three variables as predictors of purchase behavior. Our model posits that involvement, knowledge, and attitude can influence the willingness to purchase. Therefore, we hypothesize the following relationship:

- H₁: Involvement with environmental issues will have a significant positive association with objective environmental wine knowledge.
- H₂: Involvement with environmental issues will have a significant positive association with subjective environmental wine knowledge.

For hypotheses 1 and 2, we assumed that the relationship will be strongest with objective knowledge. Prior research on objective and subjective knowledge and involvement has been mixed. The nature of involvement dictates its close relationship with the amount of knowledge consumers have in relation to a particular product category (i.e. high involvement equates with higher knowledge). According to Dodd et al. (2005), when an issue involves personal importance or values, it enhances involvement. This information search may result in higher levels of consumer knowledge about alternative solutions to environmental problems such as alternative products. Accordingly, we would expect that those people have enduring product involvement with wine and who are more concerned about the environment are more likely to be knowledgeable about environmental wine production or other environmentally friendly alternatives to conventional production. Therefore for hypotheses 3 and 4, we propose the following:

- H₃: Product involvement will have a significant positive association to subjective environmental wine knowledge.
- H₄: Product involvement will have a significant positive association to objective environmental wine knowledge.

Arcury (1990) indicated that knowledge was assumed to change attitudes. Previous research by Bradley, Waliczek and Zajicek (1999) on the relationships between environmental knowledge and environmental attitudes were found to be significantly correlated between participant's attitudes and knowledge. Therefore, we hypothesize the following relationships:

- H₅: Objective environmental wine knowledge will have a significant positive association with attitude toward the environment.
- H₆: Subjective environmental wine knowledge will have a significant positive association with attitude toward the environment.

Previous research suggests that subjective and objective knowledge influence information processing in different ways. In particular, objective knowledge is more likely to influence the amount of information sought, whereas subjective knowledge is closely related to purchase-related behaviors, attitudes, and purchasing decisions.

For example, Amyx et al. (1994) found that subjective environmental knowledge was a better predictor of green purchasing intentions than objective knowledge. Therefore, given the above, for hypothesis 7, we propose:

H₇: Attitude toward the environment will have a significant positive association with willingness to purchase environmentally friendly wine.

METHODOLOGY

Design of the study

The sample for this study, a self-selected non-probability, judgment sample, was drawn from across diverse geographic locations in the United States. The URL link was distributed in September 2008 to the over 2,400 members of the society of wine educators, which include 135 members from foreign countries and members representing 43 states and the District of Columbia. The Society's goal is to foster and promote the professional education and development of the individual in particular, and the professional education and development of the wine industry as a whole. Membership in the society is represented by various professions, such as Educators, Importers, Distributors, Producers, Retailers, Restaurateurs, and Hoteliers. All members were sent the URL link.

Measures

Product involvement - Product involvement was measured by the modified version of the Personal Involvement Inventory scale originally developed by Zaichkowsky (1985). Indicators of product involvement were "unimportant /important; means nothing to me/means a lot to me; insignificant/significant; does not matter to me/matters to me," each assessed by a seven-point bipolar scale.

Environmental involvement - Following the work of Mittal (1989) and Zaichkowsky (1985), this construct was measured by modifying the product involvement questions to address the environment. Indicators of environmental involvement were "unimportant /important; means nothing to me/means a lot to me; insignificant/significant; does not matter to me/matters to me," each assessed by a seven-point bipolar scale.

Environmental subjective knowledge - This construct measured participants' self-reported assessment of environmental knowledge. The instrument construction followed similar questions developed in previous wine studies by Amyx et al. (1994), Dodd et al. (2005), and Barber (2008). An example of the three questions used in this study, each of which were anchored by *very little* (1) and *very much* (7), is: "How much do you feel you know about environmental issues

Environmental objective knowledge - This construct was measured by asking respondents about their environmental wine knowledge. The instrument construction followed wine knowledge questions developed in previous studies by Barber (2008) and Dodd et al. (2008), modified for environmental impact of wine.

Environmental Attitude - Following work by Campbell (1994), the attitude inventory consisted of five questions rated on a Likert-type scale. The questions dealt with general attitudes regarding the environment and were anchored by 1 (strongly disagree) and 7 (strongly agree). An example of the Indicators used to measure environmental attitude is "Mankind is severely abusing the environment.

Willingness to pay more for an environmentally friendly wine - Following a work by Bazoche et al. (2008) and Loureiro (2003), where they tested the purchase intentions of environmental wine products, this study used three similar statements to test willingness to pay more for an environmental friendly wine. The questions were anchored by 1 (strongly disagree) and 7 (strongly agree). An example of these indicators is "I would pay any price as long as it was for an environmentally friendly wine."

Two new variables were created for this study. First a new variable for attitude was created by categorizing the respondents with "strong attitudes", "moderate" and "weak attitudes". The second variable was subjective environmental knowledge. This variable was categorized respondents with "high subjective knowledge", "some subjective knowledge" and "low subjective knowledge".

A pilot study was conducted with the primary purpose to determine whether the instrument could be clearly understood by respondents and ensure reliability of the instrument (Churchill, 2004). A web link to the test instrument was e-mailed to 60 individuals in Texas, Massachusetts, North and South Carolina, New Mexico, and New York in August 2008. The Cronbach's alpha coefficients were all above .70 and none of the questions needed to be modified.

Data Analysis

Statistical analysis was computed using the Windows versions of Statistical Package for Social Sciences (SPSS 15.0) and AMOS (Analysis of Moment Structures, release 7.0/SPSS 15.0). Structural Equation Modeling testing centered on two basic concepts: validating the measurement model, then testing, fitting and modification of the structural model. The first is achieved through confirmatory factor analysis and the latter completed through path analysis (Tabachnick and Fidell, 2001), with construct items restricted to their respective factors but allowed to correlate with the other constructs. Structural equation modeling was performed because of its unique ability to examine the simultaneous interactions that are hypothesized by the constructs in the proposed model (Figure 1) and because it provides values that aid in the determination of how well the hypothesized models fit the data set.

RESULTS

Descriptive statistics

A total of 820 complete questionnaires were collected which represents a 42% response rate. Fifty-one percent of the respondents were male ($n=419$) and 49% were female ($n=401$). The average age of respondents was 45 years. Respondents had high levels of education with 79% of the sample having earned a college degree. Sixty-one percent of the respondents had annual household income above \$80,000, with 25% over \$140,000. Overall, the socio-demographic background of all respondents (middle-aged, educated, with higher incomes) mirrored the profile of wine consumers in general (Motto Kryla and Fisher, 2000), and were similar to data collected in surveys conducted by Barber (2008) and Kolyesnikova (2006). Following regional designations by the United States government (USG 2008), the respondents were grouped accordingly, with 48% from the southern region and 28% from the western region of the United States.

The average number of years respondents reported consuming wine was 29. The average number of bottles (750 ml) purchased per respondent was 19 per month, with the average amount spent during this same period \$435, or \$23 per bottle. When asked how much they would spend for an environmentally made wine, the respondents reported \$27 per 750ml bottle, or \$4 more than they normally would pay for a bottle of wine, suggesting there is a perception of quality and value associated with environmentally made wine.

Respondents reported moderate levels of subjective environmental knowledge ($M=4.3$, $SD = 1.3$), indicating they considered themselves somewhat knowledgeable about environmental issues. Interestingly, they considered themselves much more knowledgeable than friends ($M=4.9$, $SD = 1.2$) and much less so than environmental experts ($M=3.6$, $SD = 1.4$). As for environmental attitudes, respondents had a strong overall attitude ($M=4.9$, $SD = 1.8$) that the environment was in trouble, with the strongest feeling that mankind was severely abusing the environment ($M=5.1$, $SD = 1.8$), and wineries were not doing enough to protect it ($M = 5.5$, $SD = 1.1$). When asked about wine production and the environmental impact to the planet, respondents considered the use of pesticides, herbicides, and fungicides an important issue ($M = 5.6$, $SD = 1.4$) and the use of non-recyclable packaging ($M = 4.8$, $SD = 1.8$). The least important was the impact to the entire globe through transporting and shipping of wine ($M = 3.8$, $SD = 1.8$).

Data Reduction and Analysis of Hypotheses Model

Following procedures suggested by Ryu and Jang (2007), data were analyzed using the two-step approach in which the measurement model was first confirmed and then the structural model was tested. In the first step, a confirmatory factor analysis (CFA) was performed to identify whether the measurement items reliably reflected the a priori latent constructs (product involvement, environmental involvement, objective and subjective environmental knowledge, attitude and willingness to purchase). An examination of factor loadings, eigenvalues greater than one, and the scree plot suggested six factors. These six factors accounted for 79% of the total variance.

Following the work by Ryu and Jang (2007), Cronbach's alphas, item reliabilities, composite reliabilities, and average variance extracted (AVE) were computed (Table 1). All factor loading scores were above .75, indicating acceptable internal consistency (Tabachnick and Fidell, 2001).

Table 1. Scale Items and Confirmatory Factor Analysis Results for the Hypothesized Model (N=820)

Constructs (Cronbach's Alpha)	Target Factor Loading	Item Reliabilities	Composite Reliabilities	AVE
Product Involvement (.94)			.93	.92
Wine to me means a lot	.96	.91		
Wine to me is significant	.95	.91		
Wine to me matters	.92	.85		
Environmental Involvement (.95)			.95	.87
Environment to me matters	.91	.83		
Environment to me is significant	.90	.82		
Environment to me means a lot	.87	.76		
Subjective Environment Knowledge (.85)			.87	.84
How much did you feel you know	.90	.81		
Compared to a wine expert	.87	.76		
Compared to my friends	.84	.71		
Objective Environment Knowledge (.87)			.89	.85
Using excessive energy	.90	.81		
Creating uncontrolled water run-off	.89	.79		
Impacting underground water	.87	.76		
Creating scarcity of water	.86	.74		
Creating organic wastes	.80	.64		
Using non-recyclable packaging	.77	.59		
Attitude (.75)			.80	.80
The balance of nature is delicate	.87	.76		
Mankind is severely abusing environment	.84	.71		
Humans need to adapt to the natural environment	.80	.64		
Willingness to Purchase (.80)			.75	.75
I would pay any price	.82	.67		
I would change brands with reduced quality	.81	.66		
Ecological advertisements impact my purchase	.76	.58		

Note: = Non-target factor loadings were all below 0.45.

Cronbach's alpha for the constructs ranged from .75 to .95, while the composite reliabilities ranged from .78 to .97. In summary, the measurement of the specified model showed good evidence of reliability and validity. Using SEM procedures, the hypothesized model (Figure 1) was tested to establish and confirm the model. The results of the standardized parameter estimates and significance values are shown in Table 2 and Figure 2.

Table 2. Standardized Coefficients and p-values for Hypothesized Model (N=820)

Hypothesized Path	Standardized Coefficients	P-Value	Hypotheses
Attitude → Willingness to purchase	.27	.00**	H ₇ : Supported
Subjective knowledge → Attitude	-.11	.01*	H ₆ : Not supported
Objective knowledge → Attitude	.37	.00**	H ₅ : Supported
Product involvement → Objective knowledge	-.08	.02*	H ₄ : Not supported
Product involvement → Subjective knowledge	.07	.04*	H ₃ : Supported
Environmental involvement → Subjective knowledge	.17	.00**	H ₂ : Supported
Environmental involvement → Objective knowledge	.42	.00**	H ₁ : Supported

* $p < .05$. ** $p < .01$.

Overall Goodness-of-Fit Comparisons for the Specified Model

Model	χ^2	df	χ^2 Ratio	p	GFI	AGFI	NFI	CFI	RMSEA
No Mediating Model	787.07	144	5.47	.00	.93	.90	.92	.94	.07

GFI = Goodness-of-fit index; AGFI = Adjusted goodness-of-fit index; NFI = Normed fit index; CFI = Comparative fit index; RMSEA = Root mean square error of approximation

Based upon the model-fit-indices ($\chi^2/df = 5.5$, GFI = .93, CFI = .94 and RMSEA = .07), the model provided a good fit to the data. As shown in Figure 2, the causal relations between product involvement and objective and subjective environmental wine knowledge suggests that the more involvement with a product, directly enhances subjective environmental knowledge ($\beta = .07$, $p < .04$) or the belief in what one thinks they know about environmental wine issues, and reduces objective environmental knowledge ($\beta = -.08$, $p < .02$).

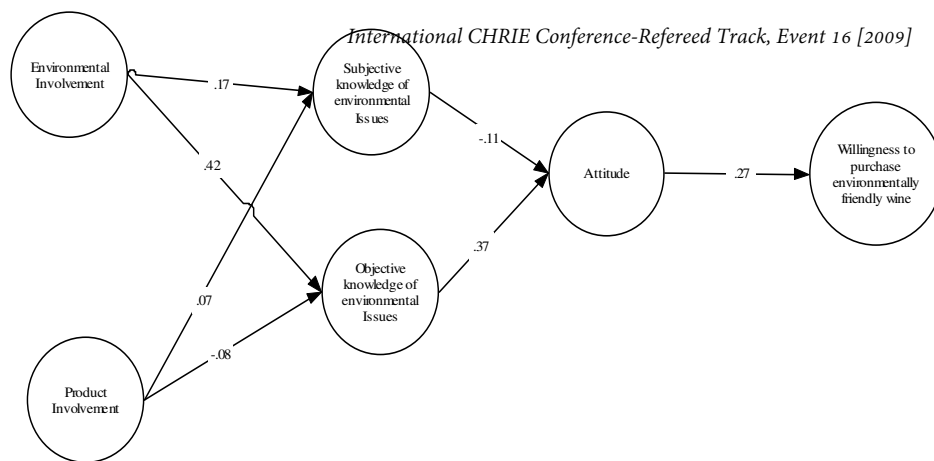


Figure 2. Hypothesized Model Showing Standardized Path Estimates

Environmental involvement related positively with objective environmental knowledge ($\beta = .42, p < .00$) and subjective environmental knowledge ($\beta = .17, p < .00$), with objective environmental the strongest relationship. Subjective environmental knowledge related negatively with attitude ($\beta = -.11, p < .01$), while objective environmental knowledge related positively, and more strongly with attitudes ($\beta = .37, p < .00$) than subjective knowledge. Finally, attitude related positively to willingness to purchase ($\beta = .27, p < .00$), indicating that stronger attitudes towards environmental issues can influence a consumers purchase behavior toward environmentally friendly wine.

DISCUSSION

The hypothesized model was tested along with the seven research hypotheses postulated to evaluate how product involvement, environmental involvement, knowledge, and attitude influence purchasing decisions. Hypotheses 1 and 2 proposed that involvement with the environment would have a positive causal relationship with the knowledge constructs of objective and subjective environmental wine knowledge. This was supported with causal relationships with the strongest relationship with objective knowledge, suggesting that with increases in general environmental involvement, objective environmental wine knowledge would increase, while subjective environmental wine knowledge increased at a much lesser extent. The implication here is that what wine consumers actually know about environmental wine issues is more closely associated with their involvement with environmental issues than with what they believe they know about wine. In other words, higher general environmental involvement builds wine environmental wine knowledge. These results support early studies by Arcury (1990), Eagly and Chaiken (1993) and Bradley et al. (1999), where they found that increased, well organized knowledge framework strongly influences attitudes.

Hypotheses 3 and 4 reported mixed results. Hypothesis 3 was supported with weak yet significant causal relations between product involvement and subjective environmental wine knowledge. However, hypothesis 4 was not supported with a negative association with product involvement and objective knowledge. This suggests that involvement with wine as a product will positively impact a consumer's belief in what they know about environmental wine issues. Finally, Hypotheses 5 and 6 also had mixed results. Hypothesis 5 was supported with strong and significant positive relationship with objective environmental wine knowledge and attitude, suggesting that the greater wine consumers' actual environmental wine knowledge, the greater their overall attitude towards general environmental issues. Arcury (1990) suggested that strong objective knowledge plays a key role in developing environmental attitudes. However, these results are counter to those found by Amyx et al (1994), where they suggested that subjective knowledge was a better predictor of behavior. Hypothesis 6 was not supported with a negative and significant relationship between subjective environmental wine knowledge and attitudes. This suggests that subjective environmental wine knowledge may decrease a wine consumer's attitude toward environmental issues.

Finally, hypotheses 7 was supported with a strong and significant relationship between attitude and willingness to purchase environmentally friendly wine, suggesting that respondents with strong attitudes will

consider environmentally friendly wine, supporting work by GFK (2007) where they found Americans were willing to pay more for a product that was beneficial to the environment. The results suggest that while the respondents typically spend more money on an average bottle of wine (\$23) than respondents in wine studies by Barber (2008) (\$15) and Dodd et al (2005) (\$18), they would be willing to spend more on a wine (\$27) purported to be environmentally friendly. Further those that reported strong attitudes would be willing to pay even more (\$30) for a bottle of environmentally friendly wine.

MANAGERIAL IMPLICATIONS

The success of a marketing model inherently lies in the ability to determine variables that differentiate consumer's performance in the marketplace. Based on the findings of this study, it can be concluded that segments which are defined by having different levels of actual environmental involvement and knowledge are distinct segments of the population which differ in a range of other personal characteristics as well.

They can consequently be used to implement selective marketing approaches aiming at attracting environmentally conscious wine consumers. In times of major ecological changes, where the global negative impact of human behavior on the environment can no longer be denied, any additional measure that can help reduce negative environmental impacts is valuable. Selective marketing is one additional tool that can be included in the environmentally sustainable management toolbox, but many other tools could be developed. Thus an important part of this approach would be developing new strategies for ecological marketing by the redirecting of consumers needs and wants toward environmentally friendly wine products, such as organic wines, and reorientation of the product mix through repackaging and re-labeling. Another approach would be to profile light, medium and heavy spenders in an attempt to assess whether an expenditure based segmentation approach could be beneficial to wine producers. It has been demonstrated in other studies (e.g. Loureiro, 2003), and in particular this study on wine, that wine consumers would be willing to pay more for an environmentally friendly product.

LIMITATIONS AND FUTURE RESEARCH

The sample method is one limitation to this study. Although this sample represents most of the states, members of this society are individuals that are highly involved with wine as a product and thus may not represent the entire population of the United States. Another possible limitation is the Halo effect. A halo effect occurs when consumers assume that because a product is good or bad on one product concern for the characteristic, such as environmental concern about wine production and pesticide use, it is also good or bad on another product characteristic (Churchill, 2004).

Although the use of socio-demographics is widely considered in marketing (e.g. Arcury, 1990), for environmental issues a suggestion for future research would be to consider the attitudes-value-behavior model as suggested by Poortinga, Steg, and Vlek, (2004) as a basis for selective environmental marketing environmental consumers.

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